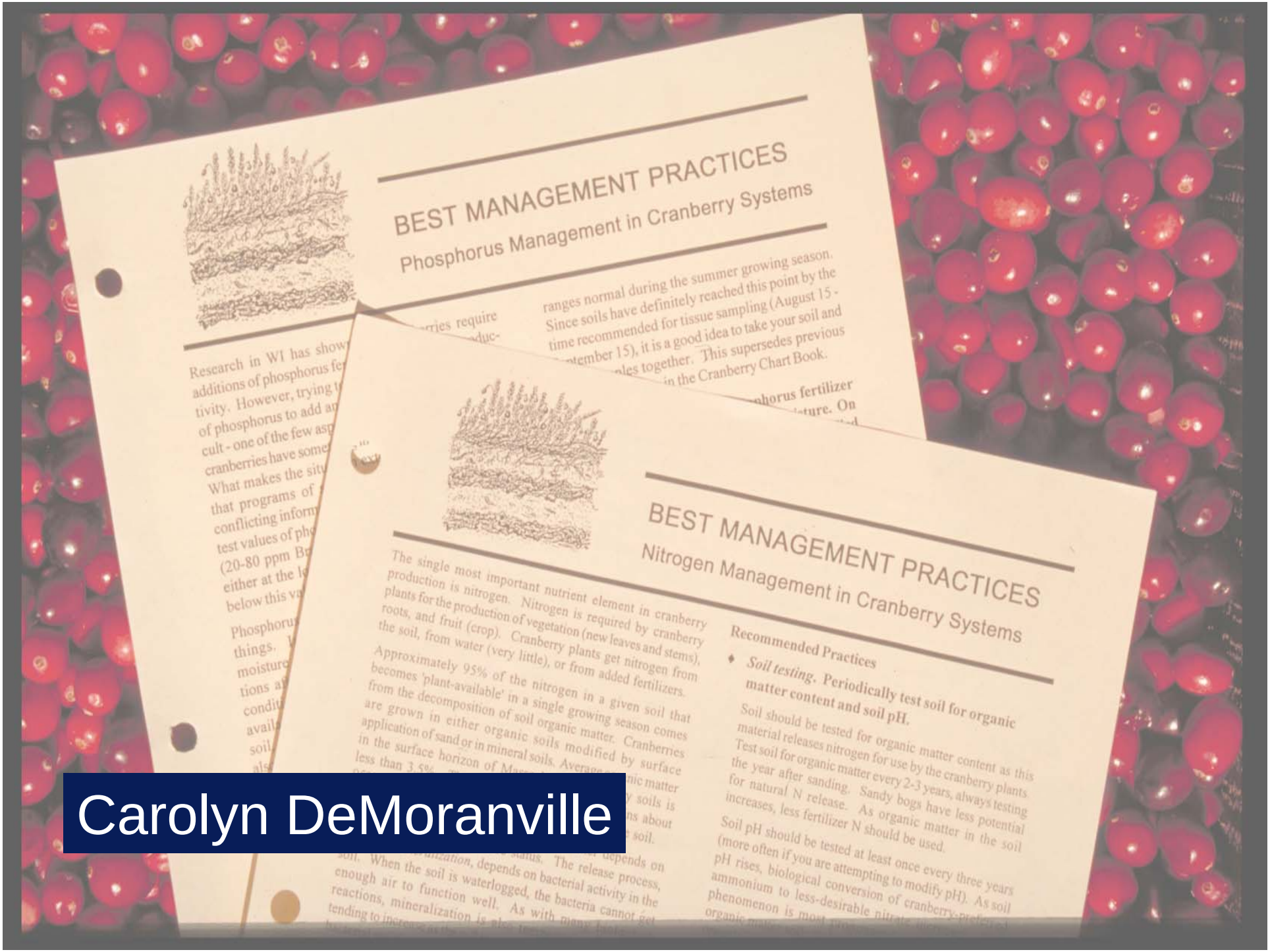
2006

Pesticide Safety 2006 - Best Management Practices 2006

Carolyn J. DeMoranville
University of Massachusetts - Amherst, carolynd@umext.umass.edu


BEST MANAGEMENT PRACTICES
Phosphorus Management in Cranberry Systems
BEST MANAGEMENT PRACTICES
Nitrogen Management in Cranberry Systems
Recommended Practices
Carolyn DeMoranville

BMPs are now on the Station web page

- Start at the home page www.umass.edu/cranberry
- Click on “Grower Services”
- Select Best management practices
- Click on a practice to get a searchable html version
- Click on “pdf” to get a printable version

Water management

Irrigation BMP:

- Irrigate judiciously
- Monitor moisture
- Conserve water while supporting production

Problem with over-irrigating

- Irrigation research Lampinen and DeMoranville
- When beds are too wet yield is less
- Part of the reason is poor fruit set and retention

Yield (bbl/a) in irrigation treatments.
Differences in 2000 and 2001 were statistically different.

Irrig. Treat.	1999	2000	2001	Cumulative 3 years
ideal	207	80	193	472
wetter	187	50	120	357
		*	*	

Data bears out the observation that most beds are too wet
1999 was the driest year of the three

Distribution of uprights into classes. Zero refers to uprights that flowered but did not support any fruit. Numbers one through three refer to uprights that supported that number of fruit. *indicates significant difference within row. 1999 and 2000 data were similar.

	2001	
Upright type	Ideal (%)	Wetter (%)
Non-flowering	61.9	63.1
Zero	18.1*	23.5*
One	17.6*	11.2*
Two	2.2*	1.4*
Three or more	0	0

Failure to retain even one fruit accounted for decreased yield in standard (wetter) irrigation plots

Water Management
Late Water

Fresh Fruit, Disease Management, Flood Management, Insect Management BMPs:

- Late water promotes quality and may reduce need for pesticide inputs

Late Water Effects

- Benefits of Late Water
  - Suppresses fruit rot for at least 2 years
  - Suppresses SRM for up to 2 years
  - Suppresses CFW and cutworms
  - Depresses dewberry populations
  - Growth stimulation (need less N)

Cultural modifications with LW
(LW in 1993)

	91-92	93 (LW)	94
# Fungicides	3.3	1.9	3.5
# Insecticides	4.2	1.7	3.4

Reduced sprays without loss of quality

Effect of LW on fruit rot incidence (process fruit bed)

- Year of LW - below threshold of 3% at harvest with no fungicides used (little or no storage rot)
- Year after LW - again no fungicide needed
- 2 years after LW - mid-rate fungicide again required

Fungicides after late water

- If the KQF is good, no fungicide in year of LW (one for fresh fruit)
- Similarly, 1 application can suffice in the year after late water (2 for fresh fruit)
- In both years minimum registered rates are recommended

Late water reduced cranberry fruitworm, allowing good control with fewer insecticide applications.

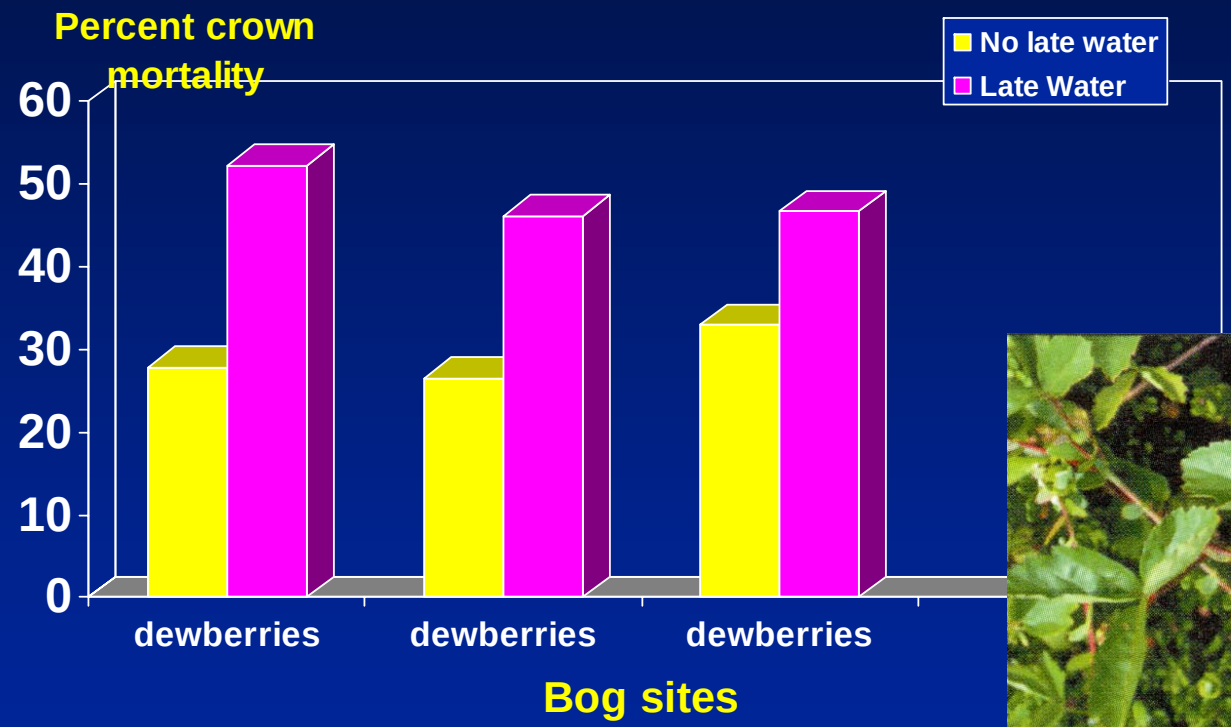
	No late water	Late water
Berries w/CFW eggs (%)	4.92	0.52
Insecticide aplications for CFW	2.70	0.88
CFW damage at harvest (%)	0.48	0.49

Cranberry Fruitworm - Late water duration experiment
Hibernacula (overwintering stage)

Four-week vs. 2.5- to 3-week late water flood. Is a shorter flood (removed early) sufficient to control cranberry fruitworm?

Site	Flood length	CFW mortality
1	2.5 weeks	50%
2	2.5 weeks	45%
3	2.5 weeks	40%
	4 weeks	**98%**
4	3 weeks	41%
	4 weeks	**94%**

Late water also suppresses dewberry (an invasive weed)



Offshooting was also suppressed

Late Water - is this a good year?

- Inspect for winter injury - off colors, leaf drop?
- Big crop in 2005?

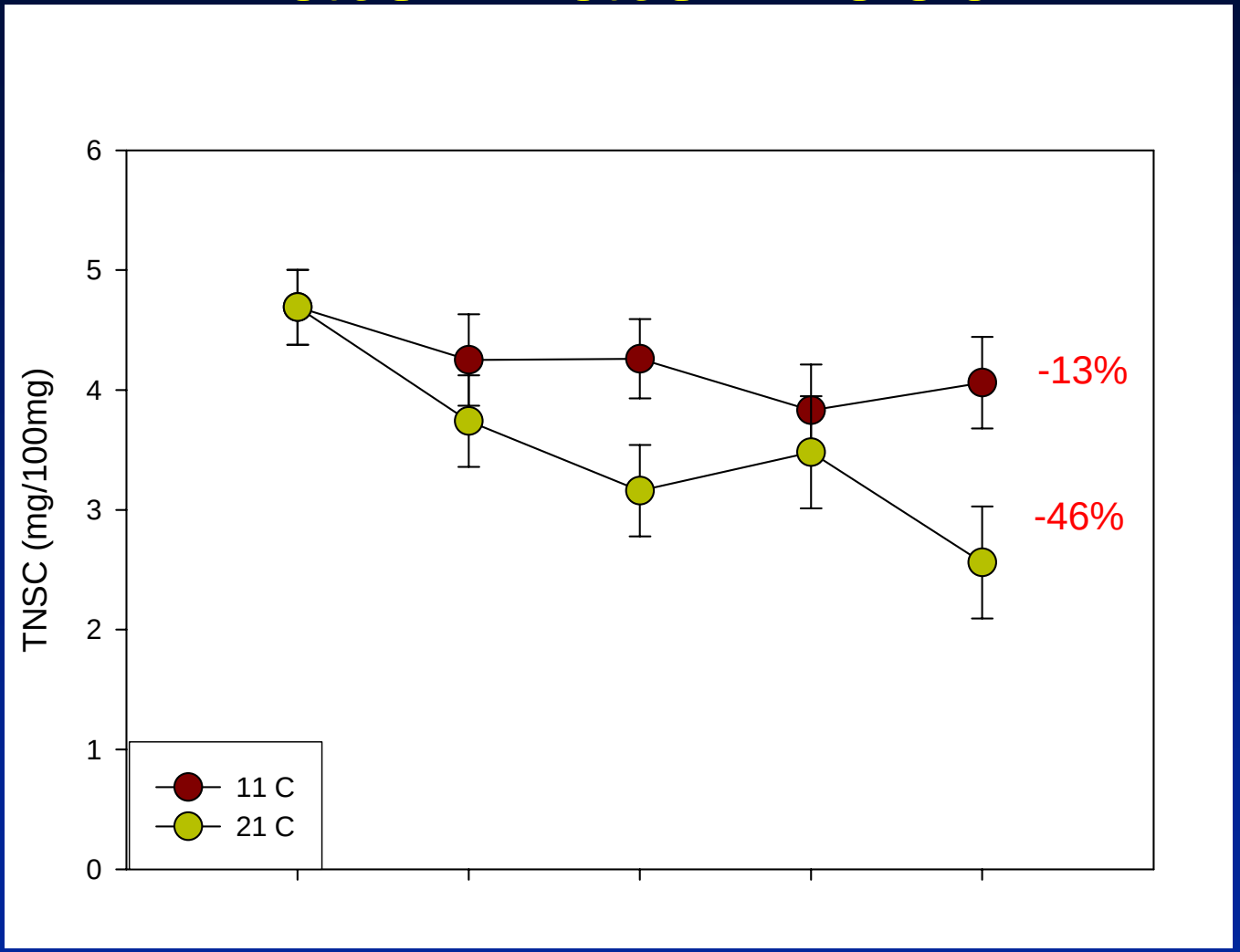
- Good sunlight in 2005
- Good dormancy conditions this winter but mild – recommend starting early

Late Water considerations

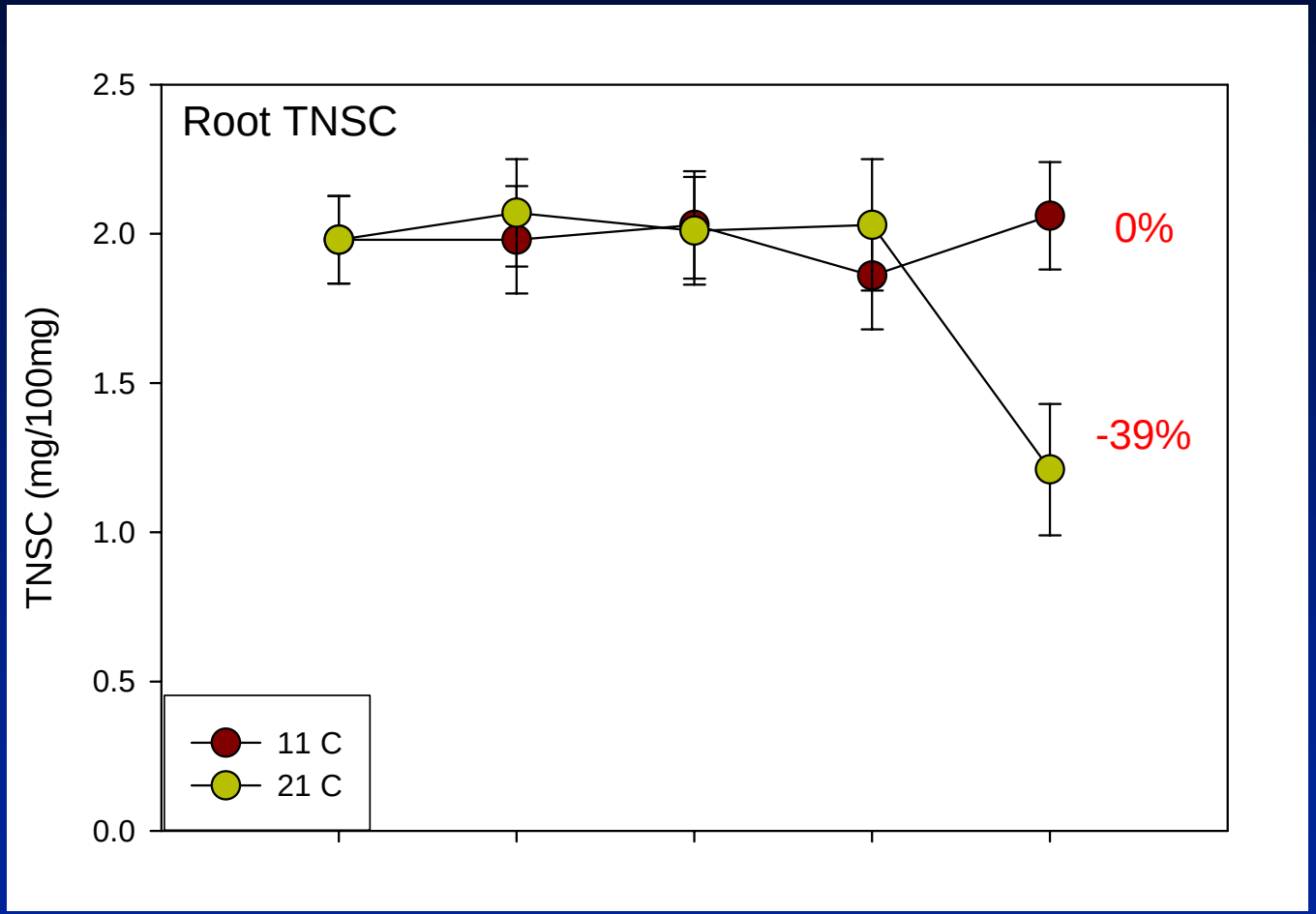
- Apply while buds are tight and red
- May need to start early this year due to mild winter
- Water temperature is critical

Lab study – Water Temperature – Justine Vanden Heuvel

Late Water flood



Late Water flood



Conclusion

- Cool LW floods had little impact on vines
- Vines subjected to warmer LW flood had had fewer CHO after the flood and even at harvest
- Vines subjected to warmer LW floods likely have reduced CHO available for spring growth

Pesticide use BMPs

- 4 BMPs relate specifically to pesticide use in cranberry production
  - Chemigation
  - Pesticide application
  - Pesticide Mixing and Loading
  - Pesticide Storage
- Recommend reviewing these prior to the start of each season

Specific reminders - Chemigation BMP

- Legal chemigation requires specific design elements in the irrigation system and pump – design diagrams in BMP
- Chemigation systems should be timed and tuned annually – BMP has directions for doing a dye test

Specific reminders – Pesticide Application BMP

- Take all reasonable precautions to avoid drift during applications
- Have MSDS sheets for all products you use. Have the label and the MSDS present during applications and transport of pesticides - they may be critical if a spill or other worker exposure occurs.
- Develop an emergency plan
- Review the checklist at the end of the BMP

Specific reminders – Pesticide Application BMP

- Calibrate application equipment annually
- Check your PPE
- Protect water resources - impound water at least as long as recommended, longer if feasible. Drop ditch levels prior to application to increase ability to impound.